

INFORMATION SYSTEMS PLANNING REPORT  
TRANSPORTATION SECTOR

NOVEMBER 1986



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TRANSPORTATION SECTOR

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# INFORMATION SYSTEMS PLANNING REPORT TRANSPORTATION SECTOR

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## I MAJOR ISSUES

### A. DRIVING FORCES

- The transportation industry has undergone many changes in the past five years due to deregulation.
  - Since deregulation, the largest airlines have remained in the forefront of the airline industry; however, their market shares have declined as smaller carriers capture more business.
    - Airlines are interested in systems such as those for airline reservation and parts inventory tracking to help them compete against other airlines.
  - Entrance into the railroad segment is expensive; therefore, players have remained basically the same since deregulation. Railroads have managed to become more profitable by assembling trains carrying piggyback truck trailers and ship containers. Information systems are used to facilitate these operations.
  - Easy entrance into trucking makes this industry segment very diverse. Profit margins, which are no longer protected, have decreased substantially. Successful trucking companies are those finding a market niche, such as those specializing in less-than-truckload (LTL) business. (LTL





business requires many terminals and freight consolidation centers to sort shipments and load trucks by destination. The high cost deters competition.) Companies specializing in LTL are looking for software that meets very specific requirements.

- Transportation companies are highly dependent on overall economic conditions.
  - Currently, the economic outlook is better for the airline industry segment than for the railroad and trucking segments. At least moderate growth is expected for the airlines, although increased labor costs and fare discounts are lowering profitability. Traffic has decreased for railroads and trucking, resulting in lower revenue and profit levels. Demand and rates have improved in the past year for Pacific containership trade and for tankers in the Middle East.
    - Trucking and railroad companies are looking at information systems to make the difference. For example, on-board computers installed in trucks result in higher productivity, better security, and reduced operating costs.
- Transportation companies are also directly affected by other industries' performances.
  - Trucking, for example, is tied closely to agriculture. The decline in the farming business, with attendant falling crop prices, lower grain sales, and the value of the dollar in foreign markets, has impacted the trucking segment significantly.
- The transportation sector has experienced restructuring over the past few years.



- Airlines operating at a low profit margin or at a loss, such as Frontier, cannot survive in the long run.
  - Others, like People Express, that have acquired a significant market share, are merging with or being acquired by larger airlines.
  - In some cases, parts of businesses are sold off, exemplified by Pan Am's sale of its Pacific routes to United.
  - Although the railroad segment comprises basically the same companies as in past years, there has been consolidation among the group.
  - Failures in the trucking segment are estimated to be at levels 50% higher than U.S. businesses in general.
- 
- Many of the larger airlines, such as American Airlines, have developed their own applications internally rather than purchasing from outside vendors. In addition, these companies will provide information services to companies they acquire or merge with as well as offer these services to outside customers.
  - Providing computer services to the trucking segment presents a challenge due to the diversified nature of the segment and the fact that many of the companies will come and go within a relatively short period of time.
  - Driving forces in the transportation industry are outlined in Exhibit I-1.

#### **B. ISSUES AND OBJECTIVES**

- Key issues include cost control, accessing better information more quickly, and technology.



**EXHIBIT I-1**

**TRANSPORTATION  
DRIVING FORCES**

- **Deregulation**
- **Economy**
- **Competition**
- **Restructuring of Industry**



- Cost control.
  - IS managers are faced with trying to keep personnel costs down while improving programmer productivity.
  - Cost and revenue measurements are critical in maintaining profitability.
- Information access/communication.
  - Unique to the transportation industry is the need to communicate with many remote, moving sites such as trucks, buses, ships, trains, and airliners.
  - Because there are so many points of transaction in the transportation business, timely information exchange between these companies and their customers is important. Information exchange would include electronic transfer of data for billing, orders, and routing.
  - Management needs to be able to access information, make decisions, and communicate rapidly.
- Technology.
  - As systems become more complex, the ability to increase capacity and make system modifications becomes increasingly complex.
  - IS managers want to know what hardware, including communications equipment, will be viable in the long run and remain cost effective.





- Objectives are focused on profitability and remaining competitive. They include:
  - Reducing costs, including equipment maintenance and personnel costs.
  - Increasing programmer productivity.
  - Improving data transfer among remote sites, customers, and management.
  - Installing new hardware.
  - Developing new applications.
- Key issues and objectives for IS managers in the transportation industry are shown in Exhibits I-2 and I-3.

### C. IMPACT OF NEW TECHNOLOGY

- Advances in technology provide communication capability with operating entities such as trains, buses, ships, and airliners, as well as with branch offices, customers, and management.
  - Telecommunications provides the capability to control operations at the vehicle level.
  - Computerized reservation systems allow seat discounting and improved loading.
  - Increased use of microcomputers as part of a computerized network provides more timely cost and revenue information to management.



**EXHIBIT I-2**

**TRANSPORTATION  
KEY ISSUES**

- **Cost Control/Profitability**
- **Rapid Communication with Remote Sites, Customers, and Management**
- **Future Directions in Technology**



**EXHIBIT I-3**

**TRANSPORTATION  
OBJECTIVES**

- **Reduce Costs**
- **Increase Programmer Productivity**
- **Improve Data Transfer**
- **Implement New Systems**
- **Develop New Applications**



- As the unit cost of collecting and transmitting data decreases, more information can be collected at the point of transaction. Since in the transportation industry there are so many locations involved, being able to transmit and collect information to and from these points is critical in decision support for cost effectiveness, profitability, and competitiveness.
- The impact of new technology is outlined in Exhibit I-4.





**EXHIBIT I-4**

**TRANSPORTATION  
IMPACT OF NEW TECHNOLOGY**

- **Competitive Advantage through Higher Productivity and Lower Costs**
- **Quick Access to Information**
- **Communication with Remote Sites, Customers, and Mangement**



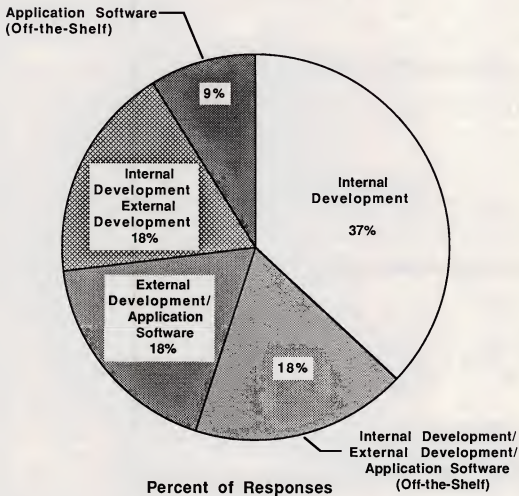
## II NEW APPLICATIONS

- In the area of new applications planned for IS departments in 1987, 54% of the new applications projects identified by respondents involve external development resources paired with either internal development staff or an application product, or both (see Exhibit II-1).
- New applications requiring only internal development resources accounted for 37% of the responses.
- Only 9% of new applications planned include off-the-shelf application software alone. These included financial reporting software and general ledger and accounts receivable software.
- Very few industry-specific external products and services, including processing services, turnkey systems, professional services, and application software products, were purchased in 1986.
  - An example of industry-specific professional services procured in 1986 was the development of a fuel allowance system for a trucking company.
  - One processing service used in 1986 was an aircraft parts inventory system.



EXHIBIT II-1

TRANSPORTATION  
SOURCE OF DEVELOPMENT FOR NEW APPLICATIONS



Cost Range: \$18,000 - \$2.0 Million



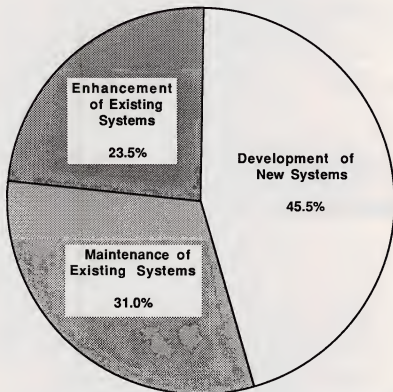
- According to respondents, 45.5% of applications development personnel are assigned to the development of new systems, 31% are assigned to the maintenance of existing systems, and 23.5% are assigned to the enhancement of existing systems (see Exhibit II-2).
- The most important applications respondents will be implementing in 1987 are shown in Exhibit II-3. In addition to those applications, the following were also identified:
  - Installation of a communications network linking minicomputers at agency sales locations.
  - Installation of increased mainframe processing capacity.
  - Image processing system for accounts payable that records on a laser disk.
- Implementation costs for new applications ranged from \$18,000 to \$2 million.





**EXHIBIT II-2**

**TRANSPORTATION  
I.S. PERSONNEL ASSIGNED TO DEVELOPMENT,  
MAINTENANCE, AND ENHANCEMENT OF SYSTEMS**



**Percent of I.S. Personnel**

III-TR-14



EXHIBIT II-3

TRANSPORTATION  
NEW APPLICATIONS FOR 1987

Most Important Applications

- General Ledger/Accounts Payable
- Financial Reporting System
- Revenue Allocation System
- Materials Management System
- Project Tracking and Management System
- Railcar Accounting System
- Aircraft Parts Inventory Tracking System
- Yield Management System for Airline Reservations







### III BUDGET ANALYSIS

- Expected growth for IS budgets in 1987 averaged 10.3% for the transportation industry respondents.
- Increases in 1987 were attributed to corporate growth , the installation of new application programs, IS salary increases, and the acquisition of new computer hardware (see Exhibit III-1).
- Decreases were generally related to hardware.
  - Some companies are purchasing rather than leasing equipment.
  - Some are purchasing new equipment with one-year service warranties to reduce maintenance costs for the year.
  - Some are moving to third-party maintenance providers to cut costs.
- Companies with budgets remaining the same reported that personnel and equipment costs had to be held constant due to a decline in business. As mentioned earlier, the trucking industry segment is heavily affected by the farming business. Since no significant improvement is forecasted for farmers in 1987, transportation companies tied to farming must control costs while they look at other markets for their service.





**EXHIBIT III-1**

**TRANSPORTATION  
INCREASING 1987 I.S. BUDGETS**

- **Corporate Growth**
- **Installation of New Application Programs**
- **Wage Increases**
- **New Equipment Acquisitions**



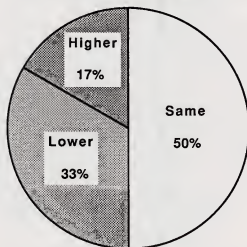
- As shown in Exhibit III-2, 60% of respondents are increasing IS budgets in 1987, budgets remain the same for 30% of respondents, and for 10% of respondents, budgets are decreasing in 1987.
- For respondents increasing IS budgets in 1987, 50% will increase at the same rate as in 1986, 33% will increase at a rate lower than in 1986, and 17% will increase at a rate higher than in 1986.
- IS budgets for transportation industry respondents averaged 1.5% of total corporate revenue in 1986.
- Respondents reported that total corporate IS expenditures included the corporate IS budget as well as other IS organizations within the company. Responses showed that the corporate IS budgets represent, on average, 90% of total corporate IS expenditures, while other IS organizations expenditures represent the remaining 10% (see Exhibit III-3).
- Exhibit III-4 shows the 1986 budget distribution and projects the growth of budget categories in 1987.
- The largest projected growth categories in 1987 are personnel, mainframes, and data communications.
  - Personnel are required for internal applications development.
  - Mainframes are required to provide processing that is being moved in-house.
  - For those transportation industry respondents that have been using outside processing services, there is a trend to move these types of services in-house.



EXHIBIT III-2

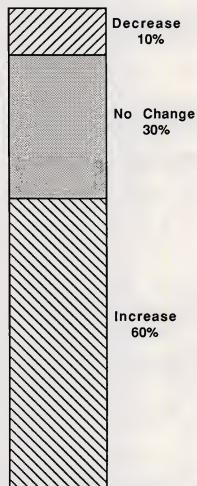
**TRANSPORTATION  
MOST BUDGETS WILL INCREASE AT  
THE SAME RATE AS IN 1986**

**1987 Budget Growth  
versus  
1986 Budget Growth**



**Percent of Respondents  
Increasing I.S. Budgets**

**1987 Budget  
versus  
1986 Budget**

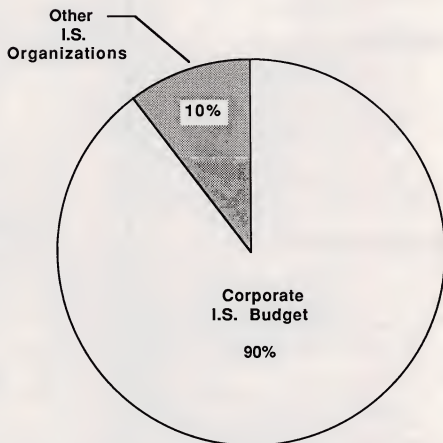


**Percent of Respondents**



EXHIBIT III-3

**TRANSPORTATION  
TOTAL CORPORATE I.S. EXPENDITURES**



**Percent of Total Corporate I.S. Expenditures**





EXHIBIT III-4

1986 BUDGET DISTRIBUTION AND  
1986/1987 CHANGES IN THE TRANSPORTATION SECTOR

BUDGET CATEGORY	1986 PERCENT OF I.S. BUDGET	1986-1987 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	47.2%	10.2%
Mainframe Processors	14.9%	16.4%
Minicomputers	1.1%	8.5%
Microcomputers	1.3%	7.1%
Mass Storage Devices	.7%	0.0%
Total Hardware	18.0%	21.6%
Data Communications	4.9%	9.6%
Voice Communications (If Part of I.S. Budget)	17.9%	2.5%
Total Communications	22.8%	4.0%
Professional Services	0.4%	8.4%
Processing Services	0.4%	-86.4%
Application Software	0.7%	3.1%
Systems Software	3.0%	6.6%
Turnkey Systems	0.5%	0.0%
Total External Services/ Products	5.0%	-1.8%
Other	7.0%	11.1%
Total All Categories	100.0%	10.3%



- Data communications are required for the type of connectivity that transportation companies are looking for. In fact, connectivity is the most important issue that information service vendors can address at present.
  - Transportation companies want to link vehicles and depots to corporate offices, and sales locations to corporate headquarters.
  - Electronic Data Interchange (EDI) can be used to transmit shipment and delivery information to carriers providing intermodal transportation.
  - Transportation companies will be looking at private and public networks accessed via phone lines and satellite dishes. Some projected future technologies, such as installing satellite dishes on trucks, have met with initial skepticism.
  - Transportation companies typically dedicate a significant portion of IS resources to data communications because of the diverse nature of the industry.
- The respondents in the transportation sector reported that software and hardware maintenance was either bundled into the cost of the software/hardware or provided by their own staff.
- In a few cases, the respondents will be changing over to third-party maintenance providers for hardware and software support to effect cost savings in 1987.







#### IV COMPANY PROFILES

##### A. COMDATA NETWORK

###### I. PRODUCTS/SERVICES

- Comdata Network, Inc. provides funds transfer services to the trucking industry and offers check verification processing services for retail establishments.
- Comdata's processing services for the transportation industry include Comchek and Express Comchek Funds Transfer Services, Fuel Purchase Program, Permit Transfer Program, and COMVOY Shipment Interchange Program.
  - With Comchek, a request for transfer of funds is made through a Comchek Service Center to Comdata. Comdata verifies the truck company's credit and notifies the Service Center as to the amount and recipient of the requested draft. The driver provides identification, Comdata issues an authorization number, and the driver endorses the draft in exchange for cash.
  - Express Comchek increases the speed and reduces the communication expense of money transfers. The driver is furnished with a supply of blank Comchek drafts. Upon request, an express code is given by his





dispatcher. A completed draft is presented to the Service Center, an authorization is obtained, and the driver receives cash in exchange for the draft.

- The Fuel Purchase Program permits trucking companies and other transportation customers to obtain cash discounts on fuel purchases through an identification card system.
  - Comdata also offers its Permit Transfer System to clients requiring special regulatory permits to transport goods within certain states.
  - The COMVOY Shipment Interchange Program allows shippers and carriers to electronically match shipments with available cargo space on trucks going to the required destination.
- Funds transfer services are provided to individual credit card holders through Comdata Service Centers located at truckstops, gambling casinos, motels, hotels, and college campuses.

## 2. MARKETS SERVED

- Comdata markets its services to the trucking industry, credit card holders, and retail establishments.

## 3. COMPANY STRATEGY

- Comdata's acquisition of Cashex in 1983 provided a growth opportunity for the company in the check authorization and guaranty service business.
- Comdata has increased the credit requirements of its trucking customers who were feeling the effects of price competition resulting from deregulation.



- The company attributes its success to the unique systems design of its electronic funds transfer system.

#### 4. RECENT ACTIVITIES

- The company has developed a new marketing team which has been assigned the responsibility of increasing Comdata's presence in the business of public money transfer.

#### 5. FUTURE DIRECTIONS

- Deregulation produced the need for increased vehicle utilization. Comdata's COMVOY system is used to schedule fleets and electronically transfer shipments that must be rescheduled to Comdata's main data base, where they are immediately available to all participating trucking customers. Comdata will continue to develop new services like these for the trucking industry.

### B. FUNDSNET, INC.

#### 1. PRODUCTS/SERVICES

- FundsNet, Inc. provides electronic funds processing and transfer services to the transportation industry and the consumer public and provides credit card processing services to retail establishments and the travel and entertainment industry.
- Dial-a-Check offers trucking companies a method of transferring funds to their drivers while en route.
- Action Check is an enhancement to the Dial-a-Check service. With this service, the trucking company provides its drivers with preauthorized coded vouchers for presentation at service centers.



- National Purchasing System makes use of the Dial-a-Check via FundsNet plastic identification cards that are issued by transportation companies to their drivers.
- Cashcall services are offered at over 125 resort hotels, race tracks, casinos, and campgrounds across the U.S., as well as in Puerto Rico and the Bahamas. Consumers can obtain a cash transfer by utilizing their VISA or MasterCard on FundsNet or other terminals located at the establishment's service center.

## 2. MARKETS SERVED

- FundsNet's revenue is derived from the transportation industry, credit card holders, and retail distributors.

## 3. COMPANY STRATEGY

- FundsNet considers itself to be an innovator in the funds transfer service business.
- In 1984, the company invested substantially in a new and upgraded technology used in the services provided to the transportation industry. The decline in operating costs of 5.5% as a percentage of revenue in 1985 demonstrates the success of the investment.

## 4. RECENT ACTIVITIES

- Transportation services grew 7% in transaction volume in 1985; however, revenue increases were small due to price competition.

## 5. FUTURE DIRECTIONS

- Management plans to take advantage of new expansion opportunities in the financial services industry.

